



Universität  
Zürich <sup>UZH</sup>

URPP Social Networks



# URPP Social Networks 2013–2024

Findings and Future Perspectives



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# Editorial

Social networks are intricate webs of connections between individuals that play a pivotal role in triggering social change. These networks facilitate the flow of information, ideas, and behaviors, creating a dynamic environment where individuals can influence one another. For social change to be meaningful and impactful, it must be accompanied by behavioral changes that are widely adopted by the majority. The interactions within social networks occur at a microlevel, where individual actions and influences accumulate and interact. As these microlevel interactions propagate through the network, they give rise to macrolevel patterns and collective behaviors. Thus, social networks are essential for understanding how individual behaviors can aggregate to drive significant social transformations. Through their ability to connect people and disseminate new norms and practices, social networks are crucial in fostering widespread behavioral changes that underpin effective social change.

Over the past twelve years, we have been able to build the University Research Priority Program (URPP) Social Networks on behalf of the University of Zurich. Without anticipating our exciting results at this point, I would like to take the liberty of listing some of the important developments of networks and findings that we have gathered during these years of working together.

Social networks have always been fundamental in shaping human behaviors, values, beliefs, and cultures, given that humans are inherently social creatures. Over time, the mechanisms of these networks evolve. Currently, networks operate at multiple levels: between states (through trade, crisis support, and cooperation in military, health, and research), between companies (involving suppliers, customers, shareholders, and partners), and between individuals (both online and offline).

Since 2014, screen time has increased while face-to-face interactions decreased, indicating the growing prominence and ubiquity of digital social networks. This shift has resulted in higher network density, enhanced participation and spontaneous activities, facilitated by Web 2.0, and the inspiration of circulating excitations within networks, such as through retweets on X (formerly known as Twitter). These dynamics lead to systems that amplify and create network effects, which are complex and difficult to predict. Consequently, social networks not only remain crucial for driving social change but also continuously transform how such change occurs, highlighting the importance of understanding these evolving interactions to effectively leverage their potential for collective behavioral shifts.

Given these insights, our team adopts an interdisciplinary approach that integrates findings from behavioral experiments and qualitative surveys to simulate collective behaviors. The resulting scenario predictions are tested in dynamic laboratory and field experiments. By combining diverse methodologies, we aim to capture the complexity of social networks and better understand the emergent phenomena that drive social change. This approach allows us to refine our models and strategies, ensuring that our interventions are grounded in robust empirical evidence and capable of influencing behavior on a large scale. With the methodology we have developed, we are able to conduct research on human values, sustainability, and social diffusion. We are proud to share new theories, methods, applications, software, and insights that can hopefully improve the predictability of complex, dynamic processes across networks and lead social change in positive directions.

During this intensive period of managing the URPP Social Networks at the University of Zurich, we have not only studied connections in networks in research, but also actively lived them in the classroom with students, as well as within our team and in exchange with other researchers. What remains in the end are not only many publications, new competence centers at UZH, or new courses, but, above all, the memories, the joy about and the gratitude for these wonderful people who have accompanied our path.

We would like to thank the University Management and the University Board for their generous support and the freedom they gave us in research and teaching, which kept us agile and allowed us to focus on our topics.

In this report, we would like to summarize the highlights of our twelve years of work and hope you enjoy reading them.

René Algesheimer



# Key Discoveries: Unveiling Our Impact

From 2013 to 2024, the URPP Social Networks conducted interdisciplinary research within three impactful pillars:

- Pillar 1: Networks & Society
- Pillar 2: Networks & Organizations
- Pillar 3: Networks & Consumers

**Summarizing our most important findings, we can say that the first pillar (P1) delved into value preferences, exploring how they define both societies and individuals. Building upon this, the second pillar (P2) developed and validated theoretical frameworks and methodologies. It integrates individual behavioral insights into dynamic models and experiments aimed at predicting collective behavior. In pillar three (P3), we investigated the effects of networks on different forms of consumer behavior to guide consumers toward better, more informed decisions.**

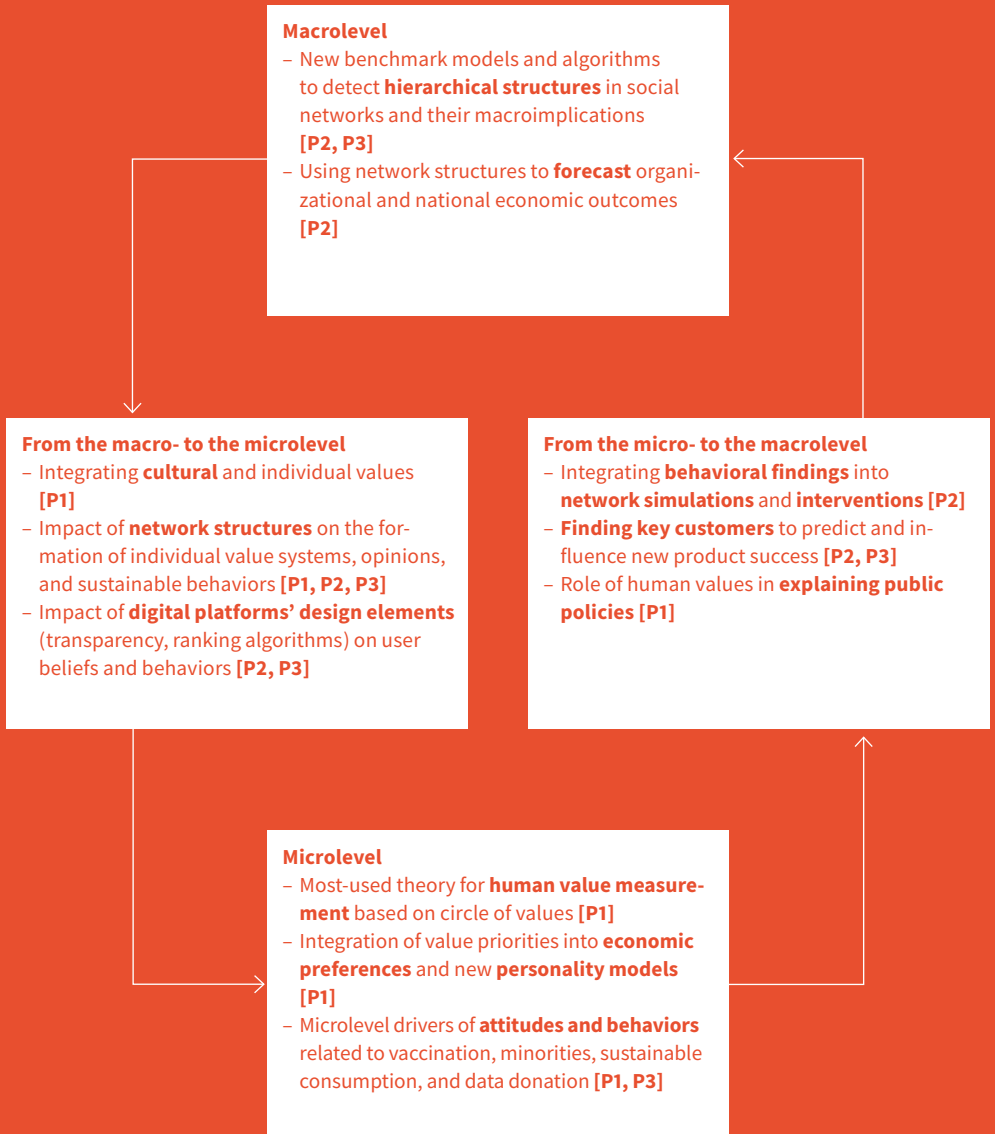
### **Theoretical frameworks and methods**

Over the years, researchers at the URPP Social Networks have realized that delving into abstract structures at the macrolevel necessitates a nuanced understanding of exchanges occurring at the microlevel. In contrast to the traditional approach in our field, we no longer wanted to separate macro- and microeconomic perspectives, but more closely investigate the relationship between them: How do structures influence our behavior, and how do our individual behavioral patterns affect our social structures and the other members of the groups we belong to?

Our most important findings, therefore, revolve around the development of methods and theories that establish connections between structural regulations and interventions impacting individual actions, as well as the inverse, where individual decision-making influences the emergence of collective behaviors. The most significant challenges presently confronting society require the development of behavioral and technological solutions (e.g., a vaccine for COVID or meat-free diets to mitigate climate change). Even in instances where society achieves advancements in their development, such as with the COVID vaccine, their efficacy remains contingent upon widespread utilization.



# Theoretical Framework



Triggering such large-scale adoption requires an understanding of social network dynamics, including the connections and interactivity of the individuals within the network and the mechanisms behind social influence. This has stood as a central topic within our URPP for the past twelve years.

We have developed the requisite theoretical frameworks and methodological approaches, collected rich datasets, and fortified our computing capacities not merely for the study of isolated components, but to advance research into complex phenomena characterized by interdependent elements that are intricately entwined and dynamic over time.

### **The role of values**

For a deeper exploration of the emergence and development of values, we conducted a longitudinal study among children and adolescents in Switzerland and Poland. To facilitate collecting data on complex topics (e.g., views on minorities) from young children, we designed a picture-based survey that measures attitudes and allows for inferences of developing values. In several other projects, we sought to understand how basic values can explain personal attitudes toward individuals or groups (e.g., immigrants), as well as other aspects of society, such as the COVID vaccine or data privacy. For this purpose, we extended the value theory together with its originator, Shalom Schwartz, and an international research team. The data we collected and analyzed allowed us to define the role of social networks on value development, and we found empirical support for both selection and socialization effects, especially for protection values: This means that adolescents select friends based on their similarities to them but at the same time become similar through their acquaintance with each other.



Members of the URPP Social Networks 2024

### **Fostering sustainable consumer behavior**

By investigating the effects of networks on different forms of consumer behavior, we contribute to more sustainable consumption of food, energy, and other goods. We conducted surveys and experiments to identify impactful strategies to reduce consumers' CO<sub>2</sub> footprints. A nuanced understanding of the influence of networks and peers on individual behavior in this context allows us to specifically search for thresholds for change and design marketing campaigns and communication strategies that promote more sustainable behavior in our societies that is in line with the United Nations' Sustainable Development Goals.

## **Pillar 1 – Networks & Society**

**We studied the effect of networks on society by investigating the role of networks in the formation of values, preferences, and opinions leading to an individual’s behavior.**

### **Theory:**

- supporting the development of sound theories within the field of values,
- value traits and value states: distinction and proposition to measure them,
- explaining behavior by using both value traits and value states,
- value structures and value preferences: differentiation of various types of value structures and their impact on value preferences,
- models of personality: developing several models by using the structural rules derived from the model of basic human values,
- integration of value priorities with economic preferences in a model of human motivation.

### **Development of methods:**

- circle of basic human values: contributing to the further development of the most often used theory and instruments to measure values in social sciences,
- methods for cross-country comparisons: developing the examination of measurement equivalence,
- European Social Survey: established for the first-time approximate measurement

- invariance for most values measured in the ESS,
- attitudes toward minorities among children: developing a picture-based survey,
- multilevel structural equation modeling: to explain nonequivalence across countries,
- empirically establishing a model that combines cultural values together with individual values.

### **Impact on society:**

- networks in adolescence: identifying the development of value systems,
- selection and socialization effects in the development of value systems: providing evidence for both, especially for protection values,
- mental well-being: discovering how various strategies of regulating emotions enhance mental well-being in diverse nations across the globe,
- depicting how basic human values can contribute to the explanation of an EU-wide social benefits scheme, attitudes toward COVID-19 vaccination, attitudes toward minorities, and privacy behavior.

## Pillar 2 – Networks & Organizations

**The main takeaway for social change, revealed by the methods we developed, is that the combination of how individuals tend to behave (behavioral traits) and where they sit in their social network (centrality) is key for the design of effective interventions.**

### **Development of theories and methods:**

- integration of individual-level behavioral findings into dynamical models,
- experiments of collective adoption processes also in presence of ranking algorithms,
- empirical validation of social contagion theories at the micro- and macrolevels,
- collective consumer behaviors: in what conditions can they be predicted and influenced by actions of few individuals (e.g., discoverers, influential and susceptible social media users, low threshold).

### **Bridging the micro-macro divide:**

- connecting microlevel interactions, meso-scale and macrolevel network structures (nestedness, community structure), and the competitiveness of economic actors,

- detecting how changes in the macro-level elements of social systems (e.g., structure, ranking algorithms, price charts communication) affect various dimensions of individual opinions, satisfaction, and trust toward the system.

### **Impact on organizations:**

- identifying key factors that influence the success of products, behavioral change policies, individuals, and organizations: they can be classified as feedback, temporal, network, and identity effects,
- highlighting threats to well-being: extreme inequalities and systematic biases against underrepresented groups in social networks can be hidden in complex social and economic systems, accurate predictions and high performance.

### **Pillar 3 – Networks & Consumers**

**The research in this area focused on social marketing in favor of sustainability, consumer dynamics, and network techniques. Our shared insights will impact further research as well as marketing campaigns.**

#### **Social marketing and sustainability:**

- mitigating food waste: tailored interventions for retailers that target distinct consumer groups, leveraging insights from grocery shopping data and food waste reports,
- more effective communication campaigns: aligning them with the cultural traits of the population and maintaining coherence with government and institutional messaging,
- the role of local government support in shaping public perceptions: Higher trust in government and science correlates with greater willingness to receive COVID-19 vaccines,
- traffic light and combined labels increase the likelihood of choosing low-CO<sub>2</sub> products,
- the role of ideological beliefs (e.g. partisan affiliation and anti-elite mindsets) in shaping public understanding of science.

#### **Consumer pricing and retailing dynamics:**

- integrating prospect theory into a dynamic game model enhances predictions in strategic risk contexts and helps to explain anomalies like auction revenues exceeding retail prices,
- customers' perceptions of distributive fairness are influenced by the actual dynamic price paid, suggesting that firms should retain pricing authority rather than delegating it to service employees,
- shifting from traditional Recency-Frequency-Monetary(RFM)-based targeting to live targeting based on individual interpurchase times at the point of sale leads to higher redemption rates, revenues, and purchase frequencies,
- mystery shoppers' assessments and sales performance lack substantial correlation: highlighting the need for a reevaluation of the efficacy of mystery shopping as a proxy for real customer feedback.

**Network techniques:**

- differentiate peer influence from personal preference: multilabel classification on networked data, integrating causal analysis,
- reframing influencer identification as a wisdom of crowds' scenario,
- R package REndo: addressing endogeneity without external instrumental variables,
- evaluating state-of-the-art community detection algorithms using the Lancichinetti-Fortunato-Radicchi benchmark graph: algorithm selection based on accuracy and computing time, assessing algorithm reliability with the mixing parameter, analyzing algorithm performance in relation to network size,
- introducing the Ravasz-Barabási-Lancichinetti-Fortunato-Radicchi (RB-LFR) as a novel benchmark: accuracy of community detection algorithms in identifying hierarchical structures within complex networks.





# Flagship Projects

Which relevance does University research have for society? With the priority program on Social Networks, The University of Zurich invested for twelve years in excellent, multi-disciplinary research with a social impact.

# Interview with the Directors

**Prof. Dr. Eldad Davidov, Professor in Sociology, and the two Marketing Professors, Prof. Dr. Martin Natter and Prof. Dr. René Algesheimer, talk about the achievements of the URPP Social Networks, which they have directed since 2013. A conversation on the importance of interdisciplinary research and the role of values and networks for a sustainable future.**

**Is it true that the whole is more than the sum of its parts?**

**Why is that? Can you please explain this using an example?**

**Eldad Davidov:** Absolutely. I think that a key to this is inter- and multi-disciplinary research in the URPP Social Networks that brings up knowledge that would otherwise be difficult to acquire. For example, economists and psychologists use different theories to explain behavior. While economists use economic preferences, psychologists use values to explain behavior. In a multidisciplinary research project, we compared the two approaches theoretically and empirically, and concluded that, whereas concepts in the two theories are related, they provide complementary explanations of behavior and are not mutually exclusive.

**René Algesheimer:** The sciences are concerned, among other things, with reducing complex problems to their individual components, decoding them, studying them in detail and creating knowledge about the individual parts. The problem with this approach is that nothing happens in isolation. All the individual building blocks are interconnected and interact with each other. The question arises, how do we reassemble the knowledge about the individual building blocks to understand the whole? Over the last two decades, researchers from a wide range of disciplines have discovered that complexity follows common rules. It almost looks as if complexity has an architecture or even a creator of this architecture. Nature follows rules. And the



From left to right: René Algesheimer, Martin Natter, and Eldad Davidov

common building block is networks. As such, I do believe that the whole is more than the sum of its parts, because the elements interact with each other. From my point of view, the beauty of life lies exactly in these interactions.

Networks are perhaps the greatest influence of information technology on our society and economy. But it is not clear where networks come from, how they form, what rules they follow, how they influence us, or are influenced by us.

**What responsibility do you have toward society as a scientist? And what is the contribution of the URPP Social Networks to society? Martin Natter, you've been doing a lot of research into sustainability and prices recently. How can we make consumption more sustainable?**

**Martin Natter:** Pricing can be used by retailers to make the overall transaction more sustainable. For instance, retailers started to let customers themselves compensate for their CO<sub>2</sub> footprint caused by their purchase. Although there are still many open questions about how this possibility affects the environment in the long term, experiments with such retailers have shown that especially younger customers are compensating at an astonishing rate, especially if we compare it to CO<sub>2</sub> compensations in the airline industry. In a project with René and his team, we are currently trying to better understand the mechanism behind voluntary CO<sub>2</sub> compensations.

Besides pricing's impact on sustainability via voluntary CO<sub>2</sub> compensations, in our research we also investigate the impact of different markdown pricing mechanisms used in convenience store grocery retailing to avoid food waste. In a current study with retail managers, including field experiments and lab studies, we find that voluntarily paid prices can outperform the conventionally used price discounts in terms of revenue as well as in terms of more relationship-relevant metrics. These promising results indicate new opportunities in retailing to make consumption more sustainable.

**Eldad Davidov, you are researching human values.**

**What exactly are values?**

**Eldad Davidov:** Values are what people consider to be important goals in life. They are often mixed up with personality, which is who we are, or with attitudes, which are much more specific than values. Values are abstract guidance in life.

### **Does anyone adhere to values at all?**

**Eldad Davidov:** Since all values are desirable, and people differ in their preference to specific values, we can safely assume that everyone follows their own values. The difference between people is which of the values they follow to guide their behavior in specific situations.

### **What research have you done on values as part of the URPP Social Networks?**

**Eldad Davidov:** We advanced the theory, measurement, and application of the value theory. First, we extended the value theory together with Shalom Schwartz and an international research team by including more specific values that can represent the value circle more precisely and explain different, more specific kinds of behavior. We also suggested an important differentiation between value traits and value states that apply to specific situations. Second, we developed a longer and shorter scale to measure these values on children, adolescents, and adults. In addition, we investigated how values may be used to explain a plethora of attitudes or behaviors like discrimination, violence, attitudes to immigrants or LGBTIQ+, or attitudes toward the EU, just to name a few. For example, we found that universalism underlines many desirable attitudes like openness to immigration and support of the EU. In addition, we studied when values have a stronger or a weaker effect in

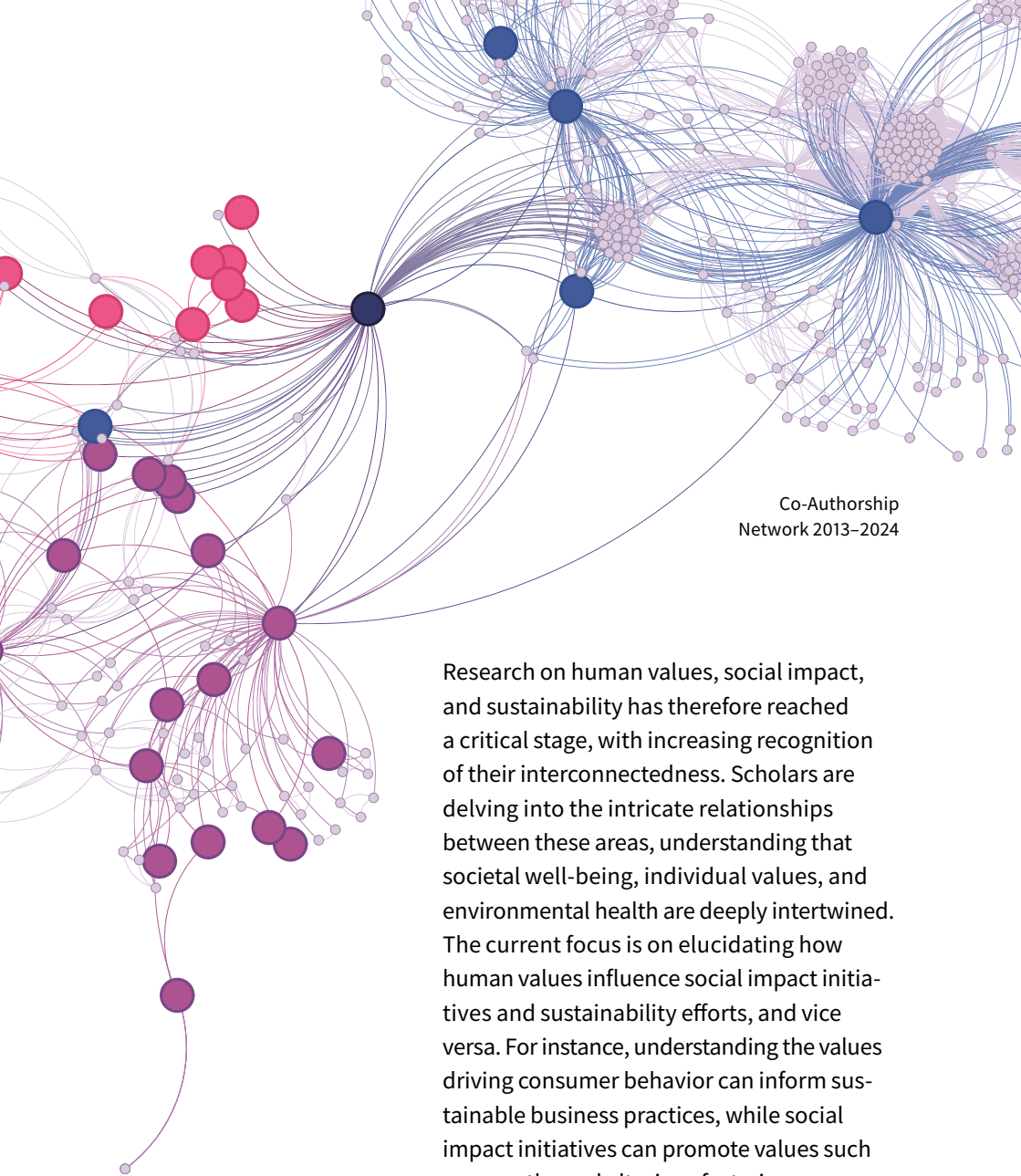


**Prof. Dr. Eldad Davidov** is Professor in Methods of Comparative Cross-National Social Research at the University of Cologne and until 2024 Professor ad personam in Sociology at the University of Zurich. His research focuses on attitudes and values, quantitative methods and empirical social research, and cross-cultural comparisons.

different countries and tried to understand why. Third, we also examined the evolution of values over time among children, adolescents, and adults, and whether networks may influence value change. To achieve some of these goals, we collected a unique panel dataset in Switzerland and Poland among children and adolescents.

**René Algesheimer, you conduct research on social impact, values, and sustainability. How are these three areas connected?**

**René Algesheimer:** Human values can be defined as fundamental beliefs and principles that guide individuals' attitudes, behaviors, and decision-making processes. As such, values are the driving forces behind our behavior. If we want to become more sustainable in our behavior, it is essential to think about our values, how they are formed, manifested, and developed in a multicultural society and how we can shape them.



Co-Authorship  
Network 2013–2024

Research on human values, social impact, and sustainability has therefore reached a critical stage, with increasing recognition of their interconnectedness. Scholars are delving into the intricate relationships between these areas, understanding that societal well-being, individual values, and environmental health are deeply intertwined. The current focus is on elucidating how human values influence social impact initiatives and sustainability efforts, and vice versa. For instance, understanding the values driving consumer behavior can inform sustainable business practices, while social impact initiatives can promote values such as empathy and altruism, fostering a more sustainable society. This integrative approach aims to advance knowledge and inform policies and practices that promote holistic well-being and planetary health.

### **Martin Natter, what research have you done on sustainability as part of the URPP Social Networks?**

**Martin Natter:** I entered the URPP in its second phase at a time where my research focus was mainly on pricing topics, not necessarily related to sustainability issues. This has changed, however, at the beginning of the third phase, when we launched an increased number of sustainability-related research projects. We started investigating the role of human values (derived by Shalom Schwartz) in different

social settings (at home vs. in workplace situations) for the same persons and related differences in these social settings to life satisfaction-type outcome measures. It was quite interesting to see how strong life satisfaction-related outcomes are affected if we must act contrarily to our own values at work because it is expected or required to be successful in that context. While I thought that such an outcome would be possible using standardized questionnaires to measure values, I was surprised that we could even show such relationships when measuring values indirectly via choosing products that were related to specific values.



**Prof. Dr. Martin Natter** is Professor of Marketing at the University of Zurich. His main research focuses are pricing and promotion, sustainability and behavioral change, and social influence and values aiming at a better understanding of the interactions between social influence, values, choice architectures, and consumers' decisions.

### **How have you incorporated sustainability into your cooperation projects with companies?**

**Martin Natter:** There is no general answer to this question. Sometimes, a cooperation starts from companies that want to use scientific insights to improve implementation of sustainable actions and sometimes, we want to investigate something in the field with a company to test the external validity of findings that we gathered via lab



experiments only. The important thing here is to stay in contact and in a dialog so that topic-specific cooperation can be established when they seem interesting for both parties.

**René Algesheimer, what will you leave behind for the University of Zurich as a URPP?**

**René Algesheimer:** We have brought together existing research in the fields of complex systems, network, social, and machine influence at the University of Zurich, and promoted new research and young researchers in their careers in these fields. In our URPP, we supervised 35 Ph.D. students in the last twelve years, produced more than 285 publications in leading international journals, and presented our work at more than 250 conferences. Prof. Claudio Tessone, who formerly worked as Assistant Professor in the URPP, founded the UZH Blockchain Center and we are happy to have been able to support his work. Currently, we are on the way to building up another competence center around social and machine influence. Over the years, we invited more than 270 international guests who presented their work to our group.

Through our engagement and commitment, we raised more than 40 third-party projects, out of which 7 were financed by the Swiss National Science Foundation (SNSF). All in all, we acquired more than CHF 18 million in third-party funds across the lifetime of the URPP.

**Eldad Davidov, what do you describe as the most important contribution or finding of your work as part of the URPP?**

**Eldad Davidov:** The study of values is a comparative study. From this point of view, guaranteeing that the concepts studied are comparable across countries is crucial. The URPP project allowed us to delve deeply into the methodology and application of cross-country comparisons, test the newest methods to examine cross-country

comparability, and apply them to the study of values and diverse attitudes using different datasets, such as the European Social Survey. By doing this we expanded our international research network significantly.

### **Do you see yourself more in the field of basic or applied research and what motivates you to do so?**

**Eldad Davidov:** I consider myself working in both research areas, as they need each other. Basic research needs to be developed to provide tools to study urgent social problems empirically in a theory-driven way to suggest solutions and policy recommendations.

### **Martin Natter, is there a highlight in what your research revealed within the URPP Social Networks?**

**Martin Natter:** My personal learning curve was quite steep in this area since I had no specific background in social networks. One of the biggest surprises came up in a research project with Prof. Andrea Giuffredi-Kähr and others where we investigated one of the big difficulties in motivation programs, namely the fact that most motivation schemes only lead to short-term success. In a tennis league (tennis shows the highest correlation to longevity among different sports), we tested different schemes to motivate participants to play at least five different matches during the summer season. Comparing monetary commitment devices and social commitment devices (and combinations thereof), we found that social commitment devices outperformed monetary devices, especially in the long run. Thus, it seems that social effects were even stronger than monetary effects. Quite astonishing for a pricing researcher like me.

## **René Algesheimer, how will your research work continue in the future?**

**René Algesheimer:** We have decided to expand the large research area of social influence to include the influence of machines, artificial intelligence, and bots on human behavior. The greatest current challenge is to make verified influence provable and to uncover causal micro- and macrorelationships that lead to this influence. In a world that is becoming increasingly overloaded with information, it seems more and more difficult to distinguish reality from one's own perception and from manipulated perception. This is where I see the value of our work in the coming years. I want to do my bit to help people regain a clearer view of what is happening around us.

## **Can you tell an anecdote from your URPP time?**

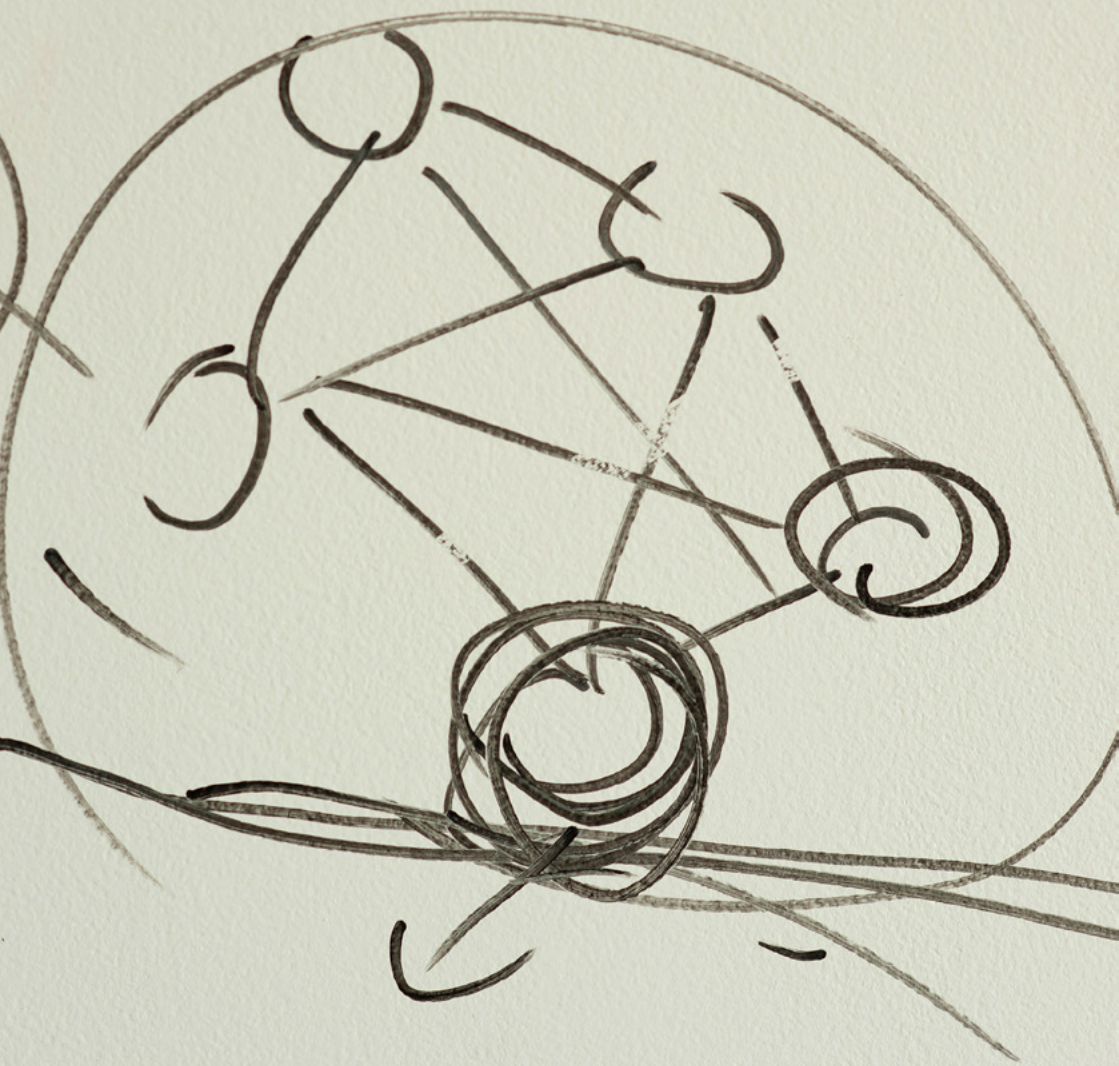
**René Algesheimer:** There are certainly many anecdotes to tell from these twelve years. The best experience for me is that – to paraphrase the author Max Frisch – we hire employees, but people come to us, work with us, grow and develop with us. This experience of human exchange is irreplaceable and the real, true social influence that counts.



**Prof. Dr. René Algesheimer** is Professor of Marketing for Social Impact at the University of Zurich. His research interests lie in studying human values, consumer well-being, and social (influence) processes for more sustainable living. His research focuses on the ways social structures shape individual behavior, and, in turn, how individual behaviors produce social structures.

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# Research Highlights

What prompts people in social networks to change their values and behavior in a sustainable way? We developed new theories and methods to analyze the complex links between individuals and networks.

# Interview with the Project Leaders

**The current project leaders, Prof. Dr. Jan Ciecuch, Prof. Dr. Andrea Giuffredi-Kähr, and Dr. Manuel Sebastian Mariani, share insights into the research done within their groups.**

## **Where does your affinity for networks come from?**

**Jan Ciecuch:** My expertise lies in the field of psychology. The presence of research in the social network paradigm within psychology is quite limited, which is somewhat surprising. Given that psychology aims to explain human behavior, the progress of various research lines should inevitably include examinations of various phenomena from a social network standpoint. Even Aristotle, the originator and forerunner of numerous sciences, including psychology, contended that humans are inherently social beings. Hence, if humans are social beings, their behavior cannot be explained without considering the networks of social relations. Viewing it from this angle, the social network paradigm is not merely one of many paradigms to choose from. Instead, it emerges as a viewpoint that must be considered in various approaches to different phenomena so as not to lose sight of the core of matters.

**Manuel Sebastian Mariani:** I'm a trained physicist. While studying for my Bachelor's and Master's, I became increasingly fascinated by interactions, ranging from the scattering of two or few elementary particles in large accelerators to the myriads of exchanges between the atoms and molecules that form liquids and glasses. What I find most intriguing is that interactions can create something qualitatively different. In accelerators, the collision of two particles can generate new particles. In materials, sharp phase transitions emerge that could not be anticipated by looking at the individual atoms and molecules. As I started shifting my focus from physical to social systems, I was driven by understanding how the interactions between individuals,



Jan Ciecuch and Manuel Sebastian Mariani

organizations, and algorithms shape the collective behaviors observed in our societies.

**Andrea Giuffredi-Kähr:** I've always been curious about why we think and act the way we do. Since humans are naturally social beings, understanding how our opinions, attitudes, and decisions are influenced by others in social networks is essential. Social networks like Facebook and Instagram allow us to stay connected and share moments, while Pinterest and TikTok inspire us with new ideas and creativity. However, there are also important downsides. For instance, Snapchat's Solar System feature that ranks friends based on closeness can create feelings of exclusion and Instagram's beauty filters can negatively impact our body image and self-esteem.

In his best-selling book *The Hype Machine*, referring to social media, Sinan Aral, Professor of Management, Marketing, IT, and Data Science at MIT, writes: "By looking under the hood at how the Hype Machine

operates and employing science to decipher its impact, we can collectively steer this ship away from the impending rocks and into calmer waters.” In line with this perspective, our research aims to understand the impact of social networks on consumers and reveal the basic mechanisms behind the formation of attitudes, preferences, values, and opinions.



**Prof. Dr. Andrea Giuffredi-Kähr** is Assistant Professor of Marketing in the Digital Economy at the University of Zurich and project leader of Pillar 3 – Networks & Consumers at the URPP Social Networks. Her research focus lies in branding and consumer behavior and highlights the transformative influence of digitalization on marketing strategies, while exploring current themes like transparency in online retail, the dynamics of influencer marketing, and innovative strategies for fostering sustainable behavioral change. She took the lead for the project from Prof. Dr. Markus Meierer, Assistant Professor in Marketing Analytics at the University of Geneva since 2022.

**Andrea Giuffredi-Kähr, you are the project leader for the Consumers area within the URPP Social Networks. What makes networks so important for consumers?**

**Andrea Giuffredi-Kähr:** We must understand that consumers are influenced by social networks at every step of their purchasing-decision journey. Research within our group revealed that social signals such as liking news articles on social media often misguides individuals to feel better informed without having read the article, causing potential misinformation. Additionally, in social networks, people often share a great deal of data, which can lead to privacy issues. Research found that individuals may underestimate privacy costs when sharing data for personal benefits, such as when signing up for online services. In the context of social good, people may overestimate these costs, resulting in less data sharing for societal benefits, such as combating climate change.

By understanding these influences, our research aims to guide consumers toward better, more informed decisions.



**Manuel Sebastian Mariani, you are managing the Organizations area within the URPP Social Networks. What makes networks so important for organizations?**

**Manuel Sebastian Mariani:** The ability of organizations to create and deliver value for consumers and the society depends on their ability to innovate and stimulate the adoption of their innovations. Both activities are vitally dependent on networks.

An organization's capability to innovate can be either facilitated or constrained by the organization's position in the economic ecosystem, which is determined by the technologies the organization possesses as well as the patterns of interactions between the organization and its allies. This is the subject of economic complexity, one of the main directions in our pillar. An organization's ability to stimulate the adoption of the innovation it created critically depends on the organization's understanding of the social networks that connect the consumers.

**What is your specialty?**

**Manuel Sebastian Mariani:** My specialty can be described as collective behavior – a quest to understand how individual choices and actions trigger the emergence of collective behaviors, and how changes in the social fabric affect the individual.

**Has the importance of networks for society, organization, and consumers changed over the twelve years of the URPP and how important are networks today?**

**Andrea Giuffredi-Kähr:** Over the past twelve years, the importance of networks for consumers has changed significantly due to advancements in technology and the widespread adoption of social media platforms. Initially, social networks mainly served as channels for personal connections and sharing life updates. Today, they play a more

diverse role in consumers' lives, influencing how they consume news articles, discover new products, and engage with peers, influencers, and brands. At the same time, networks have introduced challenges such as the spread of misinformation and sometimes unrealistic images of life, which can impact consumers' well-being. Overall, networks are now a central part of the customer journey, playing a key role in how consumers form attitudes, preferences, values, and opinions.

**Manuel Sebastian Mariani:** As humans are a social species, social networks have always been central in shaping behaviors, values, beliefs, and cultures. What changes over time is how they operate. Compared to twelve years ago, we see a tendency to increase screen time and reduce the time spent in face-to-face interaction. This means that while digital social networks were already on the rise in 2014, they are even more prominent and ubiquitous today. This makes it vital for organizations to decide how to present themselves in these networks, and to choose the right audience and message. Failure to do so can result in failures in marketing campaigns, as suggested by the failure of highly advertised products such as Google Glasses and the Google+ social network, and the recent difficulties faced by Meta in promoting the adoption of the metaverse.

At the same time, offline networks remain highly relevant to our well-being and most important decisions. Yet they remain often hidden from the massive digital traces we collect from online platforms. This absence of data poses substantial challenges to organizations seeking to promote change in consumer behavior, as they may not know the position of the consumers in the relevant, offline networks. In one of our ongoing projects on social sensing, we seek to reconstruct offline social network structures by leveraging the rich local knowledge possessed by the studied populations' members. In sum, despite the rise of big data, the coexistence of offline and online networks makes

it challenging for organizations to identify the networks where social influence is channeled.

**Jan Ciecuch, what responsibility do you have toward society as a scientist? And what is the contribution of the URPP Social Networks to society?**

**Jan Ciecuch:** I think we scientists hold a privileged position compared to other societal roles today and the historical standing of scientists.

We have gained access to knowledge and can now further expand our knowledge in interesting or essential directions. Thus, in some way, I view it as our duty to society. Personally, I perceive this duty as an obligation to prioritize not just intellectually stimulating pursuits but also those that hold social significance. The URPP Social Networks provided such an opportunity as the program addressed fundamental aspects of our social functioning.

**Do you see yourself more in the field of basic or applied research and what motivates you to do so?**

**Jan Ciecuch:** It appears to me that this distinction between basic and applied research is somewhat oversimplifying. In general, I believe that the application of scientific knowledge is highly crucial. However, it is worth noting that in principle, significant and ground-breaking applications typically stem from basic rather than applied research. In applied research, we seek a solution within a quite precisely predefined area of inquiry and in a sense, we are prisoners of this predefinition. On the other hand, basic research allows us to

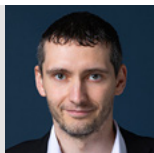


**Prof. Dr. Jan Ciecuch** is Associate Professor of Psychology at the Cardinal Stefan Wyszyński University in Warsaw and project leader of Pillar 1 – Networks & Society at the URPP Social Networks. His research interests focus on personality psychology, developmental psychology, and methodology. Together with his collaborators he developed several theoretical models of various domains of personality including personality structure, personality competencies, well-being, temperament, etc.

explore questions that may not arise in applied research. If these questions are significant and the answers are proven to be accurate, they will eventually have practical implications. An example could be Faraday, the father of electric motors, without which it is difficult to imagine today's world. Once, one of the ministers of the United Kingdom visited his laboratory and asked: What will we gain from

your research? Faraday replied: I have no idea, but I'm sure your successors will get great taxes for it.

**Manuel Sebastian Mariani:** Physicist Richard Feynman famously said that no matter how beautiful a theory is, if its predictions do not square with experimental results, it is wrong. This mindset summarizes what differentiates scientific thinking from other types of knowledge. To be scientific, a theory must be falsifiable through experiments. What is most appealing to me is the possibility to develop theories on how social and economic systems work, articulate their implications, and test them in an applied context, which often reveals the practical benefits of the research for organizations. Therefore, I see myself at the interface between basic and applied research.



**Dr. Manuel Sebastian Mariani** is a research group leader at the University of Zurich and project leader of Pillar 2 – Networks & Organizations at the URPP Social Networks. His research focuses on the micro-macro mutual influence between the heterogeneous drivers of an individual's behavior and the emergence of collective behaviors. His research aims at developing theoretical models and practical tools to understand how interventions on social systems implemented today will affect the collective behaviors of firms, consumers, and algorithms tomorrow.

**Is it true that the whole is more than the sum of its parts?**

**Why is that? Can you please explain this using an example from your field?**

**Manuel Sebastian Mariani:** It depends. In complicated, but not complex systems like an airplane the whole is (hopefully) not more than

the sum of its parts. By this, I mean that once the functioning of an airplane's components is specified, we expect the plane to behave in predictable ways, even in the presence of adverse atmospheric conditions. This predictability can be rarely achieved in complex social systems, which are the focus of my research. In these systems, the whole is different than the sum of its parts, and this is due to the interactions between the parts and the emergent phenomena they generate. Consider a music market where people can download songs they like. If the whole was merely the sum of its parts, the success of the songs in terms of its number of downloads would be accurately determined by the aggregation of the individuals' preferences. This is not the case in real markets. In a series of experiments in the late 2000s, Salganik, Watts, and Dodds observed that in the presence of social interactions, the visibility and subsequent downloads of songs in a platform is highly dependent on their success in the very early stages of the platform's development. This is true even when this early success is deceptively manipulated. As a result, the success of a product can be very different from the sum of individual consumer preferences.

**Please describe the most important findings that you have generated over the twelve years of work at the URPP Social Networks.**

**Andrea Giuffredi-Kähr:** Social networks represent complex systems, often comprising groups of individuals that are heavily connected among themselves, but sparsely connected to the rest of the network – known as communities. In our research, we have developed techniques to advance network analysis, including guidelines that help to choose the most adequate community detection algorithm for a given network or approaches to better identify influencing individuals in a network. In addition to the critical insights related to misinformation and data sharing that I already mentioned, we have also developed methods to assess customer value more accurately, recognizing that

consumers do not make decisions in isolation but are influenced by social activities such as word-of-mouth recommendations. Further, we have produced insightful knowledge in human-machine interactions, for instance, how artificial intelligence can mitigate the tendency to under-delegate, especially when people face decisions that require a high degree of control. Our research also extends to fostering more sustainable consumption. For example, we have identified ways to improve the tracking of food waste, which holds great potential for also reducing it.

**Manuel Sebastian Mariani:** The most important findings we generated over the twelve years of work relate to the development of methods and theories that connect individual decision-making with collective behaviors. These include the reinterpretation of social contagion processes in terms of individual decision-making, the development of experimental methods to test social contagion theories at the individual and collective levels, and the understanding how changes in the design elements of digital platforms (such as the ranking algorithm, price transparency, and social network structures) affect individuals' behaviors, and the eventual performance of the platform.

### **What can we learn from network research that we would not know without it, and who can benefit from these results?**

**Manuel Sebastian Mariani:** It seems natural to conjecture that large-scale social change can only be triggered through large-scale interventions. But from network research we learn that, instead, even local interventions can cause large-scale change by producing effects that reverberate through the whole system. Ideally, both organizations and consumers profit from these learnings. In the long run, I envision a network science that provides organizations to design mutualistic environments where organizations and consumers support each other toward their objectives.

**Jan Cieciuch:** Human behavior is not solely determined by physical conditions in the environment or biochemical factors in the brain. Humans are primarily the authors of their behavior, and values play a crucial role in shaping it. Values are an ancient and profoundly philosophical concept. Social sciences in the 20th century began employing this concept to explain human behavior and the behavior of social groups and entire societies. The empirical approach of these sciences allowed us to gather reliable data, albeit on quite a limited number of topics. One such limitation was the focus on studying values in individuals (people or groups) and their preferences. Research then expanded to include the development of value systems in adolescence and even childhood. Good measurement tools were developed, models were verified, and various relationships and mechanisms were identified, but individuals were still usually studied in isolation, as this was what could be measured. The situation reminded of the anecdote about a man searching for his keys under a lamp. When asked if he lost them there, he replied: “No, but this is where the light is.” Also, the formation of value preferences until recently was studied in isolation from social networks. Applying the paradigm of social networks in our group allowed us to illuminate the area where the key might lie, and to begin studying the shaping of values in the Aristotelian spirit of humans as social beings within the social network.

**What would you change if you were to work on such a large project again?**

**Jan Cieciuch:** This is an important question. I do not have a definitive answer, but I would like to point out that such a large project initiated in 2024 would be entirely different because much has changed both in the world around us, which is the context of our research (e.g., a general decrease in the sense of security), in the social world, which is the subject of our research (ongoing networking through

social media, the explosion of artificial intelligence), and in the scientific world (e.g., the role of publications in a world with exponentially increasing numbers of them). All of this makes it difficult to formulate conclusions that would optimize future projects. However, it can certainly be said that the URPP Social Networks project has led to fascinating results and initiated specific processes and collaborations that will continue even after the project ends.

**Manuel Sebastian Mariani:** Personally, I would seek feedback from colleagues with very different backgrounds earlier in the process. With the benefit of hindsight, I would prioritize projects where diverse expertise is needed, and minimize projects that see no benefit from diversity. Problems in complex systems – ranging from firms’ strategies to global challenges – are unlikely to be fully solved by one discipline alone. Hence, I believe there is enormous potential in projects that combine methods and paradigms from diverse disciplines.

**Based on your findings, could you please give us an insight into how your research is progressing and what you are planning for the next few years?**

**Andrea Giuffredi-Kähr:** Considering the rapidly changing landscape of social networks and their impact on consumers and individuals within these networks, I think it is essential that we keep researching ways that allow us to leverage positive aspects of social networks, such as fostering shared feelings of community and belonging, but also mitigating potential drawbacks. For example, my current work involves a collaborative study with colleagues from the University of Bern and the HEC Paris. We are examining the influence of parents who partner with brands to promote content featuring their children. Our research aims to understand the impact of this practice and identify strategies to minimize potential negative consequences for the children involved. This includes rethinking the approach of





Andrea Giuffredi-Kähr

featuring children, aiming to establish ethical standards and practices that prioritize their well-being and privacy. Overall, with our research on social networks, we aim to provide valuable insights and recommendations that benefit consumers, organizations, and society at large.

**Jan Ciecuch:** I intend to continue my research, which, much like the studies in the URPP Social Networks, transcends conventional frameworks and paradigms. I'm thrilled to have had the opportunity to participate in this project and contribute to its success. It has been an exhilarating scientific adventure.

**Manuel Sebastian Mariani:** Currently, the two main directions in my research are social contagion processes and the impact of ranking algorithms on collective consumer behavior. While I have been working on them mostly in parallel, I increasingly see the need to study them together. In social contagion, an individual's decision to adopt a new product is influenced by their social contacts' decisions. But we increasingly live in a human-machine social system where AI agents influence how we acquire and process information. We do not yet fully understand how individuals and machines interact and produce large-scale behavioral changes. And, more importantly, how to ensure that the resulting change benefits individuals' well-being. This is an important direction for my future research.

We thank you for the interview and wish you all the best for the future!



# Teaching the Marketing Analytics Curriculum

Our teaching philosophy is based on an interactive class environment. At the University of Zurich, we developed a teaching program in data science with applications to marketing. This program offers nine different courses on all educational levels for Bachelor's, Master's, and doctoral students.

# Interview with the Project Leader

**Our Marketing Analytics Curriculum is introducing students to modelling in R, Python, advanced modelling, and market analytics classes, as well as network analysis and complex systems thinking. The development of our teaching program was supported by the UZH Teaching Fund (ULF) which allowed us to transfer our courses into an innovative e-learning concept that is now available to students for self-learning. Dr. Radu Tanase is managing the program and shares details on special features of this curriculum for the business students at UZH.**

**Dr. Tanase, you are managing a teaching program called Marketing Analytics. What is the intention behind the program?**

**Radu Tanase:** Marketing analytics has become one of the main pillars of modern business research. Therefore, it is essential for the Business Department to prepare our students sufficiently well for this field. Recognizing this need, our team has invested significant effort over the past decade to create quantitative courses tailored to business students. While related courses may exist in other departments within the faculty, they often prove to be excessively technical. Therefore, our distinct approach has been highly appreciated by the students following a business-related program.

**Could you please describe the program in more detail. What are the courses you offer?**

**Radu Tanase:** We believe that to be prepared to tackle business questions, students need to: (1) translate a business question into the appropriate technical question; (2) understand the fundamental principles behind statistical and machine-learning methods; and (3) be able to code. This is what our program offers, through a selection of courses at both Bachelor's and Master's level.



Susanna Flühmann and Radu Tanase

This includes fundamental programming knowledge through courses like *Introduction to Programming for Marketing Analytics (R or Python)* and advanced programming skills through courses like *R/Python – A Non-Technical Overview of Big Data Techniques, Teamwork and Interactive Visualization with Applications to Marketing*. Moreover, our curriculum extends to basic data analytics with courses such as *Marketing Analytics* and *Machine Learning – A Non-Technical Introduction with Applications to Marketing*, as well as advanced seminars where the two topics (programming and data analytics) are combined. In the seminar *Collective Consumer Behavior*, students can experience marketing research firsthand by in-depth study and reproduction of well-known results from the social influence literature. In the seminar *Prototyping Data Science Products*, students learn to create a full marketing analytics web application, often in collaboration with industry partners.

### **What makes the program distinct from other programs at Swiss universities?**

**Radu Tanase:** We have two key differentiating factors. The first is our focus. We try to teach technical concepts in an easy-to-understand and nontechnical way. Our target audience is students interested in Marketing Analytics and Data Science, but who don't

have the required technical background.


The second is our method. All our courses are exclusively taught in a hands-on workshop format. We invested significant effort to prepare well-structured materials and to prerecord all lectures. Today, in our typical class, students go through the material at their own pace, and we are ready to help them with any questions they might have. This has changed our position from lecturers to coaches. Our innovative teaching format is the outcome of an iterative process started ten years ago by our former colleagues Markus Meierer and Patrick Bachmann, incorporating feedback along the way from both students and practitioners.



**Dr. Radu Tanase** is a Senior Research and Teaching Associate at the Chair of Marketing for Social Impact at the University of Zurich. He investigates how the interplay of individual and social factors impacts our decisions and how this could be leveraged to help people make positive changes. He is the manager of the Marketing Analytics program and teaches business students the fundamental principles behind statistics, machine learning, and computer programming.

### **Recently, your curriculum has been supported by the UZH Teaching Fund (ULF). What have you done within this innovative program and what is your contribution?**

**Radu Tanase:** After having experimented with the workshop format for more than ten years and having had positive results, we decided to take it one step further and move the entire content online such that we can use the in-class time for extensive applications, where we are



able to provide continuous support. Something we observed while teaching is that students usually understand the materials taught quite well and can successfully address the exercises, but they are having a hard time extrapolating their knowledge to scenarios that follow a slightly different pattern. We hope that giving students more time to synthesize the knowledge (through the online format) and challenging them with a wider range of applications will lead to a deeper acquisition of skills and greater versatility.

**What are your plans for developing the program further?**

**Radu Tanase:** We are working on two directions. The first is extending the hybrid setup to most of the foundational courses we offer, such that we can dedicate the time in class to applications and advanced seminars. The second is addressing the challenges and opportunities raised by generative artificial intelligence tools. This will most likely have a significant impact on what we teach and how we teach it. We need to understand both how AI changes, which skills are relevant on the job market, and what alternative teaching methods AI enables.



Manuel Sebastian Mariani, Jan Ciecuch, and Radu Tanase





# Education and Career Development

Since 2013, more than 55 collaborators have worked in the core team of the URPP Social Networks. Under the guidance of the five directors and five project leaders, they developed research projects, maintained collaborations with external organizations and internationally renowned academics from other universities.

## Facts and Figures

Our collaborators offered 230 different teaching courses and educated around 13 000 students at the University of Zurich. They incorporated the most recent developments in their disciplines into the supervision of more than 550 Bachelor's and Master's theses.

They conducted over 40 third-party-funded research projects and published more than 330 scientific papers.

Within our program, 35 doctoral students graduated, not only supported by the professors and postdoctoral researchers, but also by a dedicated manager and some 110 000 cups of coffee ...

Since 2013

**13 000**  
students taught

**4**

Assistant Professors

**6.5**

M CHF third-party funds

**55**  
collaborators

**330**  
papers published

**2**

Professors ad personam

**40**  
third-party-funded  
projects

**146 000**  
e-mails received per collaborator

**230**  
classes offered

**550**

BA and MA theses supervised

**270**  
conference presentations

**7**

SNSF projects

**130**  
invited talks  
of team members

**110 000**  
cups of coffee consumed

**35**

graduated doctoral students

## Education and Career Development



Founders and members for many years:  
Jan Ciecuch, Radu Tanase,  
Andrea Bublitz, Manuel  
Sebastian Mariani (top);  
René Algesheimer, Martin  
Natter, Susanna Flühmann  
(right)

# Organigram 2024





# Benefit for the Public

The University Research Priority Program (URPP) Social Networks conducted research designed to better understand how to manage social change. By bridging the existing divide between theories of behavioral change at the individual and collective levels and providing actionable insights for policymakers, it aimed to contribute to the creation of sustainable, inclusive, and functional societies.

In today's rapidly evolving and interconnected world, understanding and managing societal change is more important than ever. At the URPP Social Networks we used an integrative approach that bridges the basic foundations of individual-level behavior (human values and attitudes) with the macrolevel dynamics of large-scale behavioral change (interactions between different actors and their social networks) to study how change can be effectively stewarded and derive policy implications.

Key results of our research include measuring the stability and change of fundamental human values during childhood, a network-based understanding of how human values develop and spread in society, a theoretical framework for social change interventions that integrates individual and collective behavioral change models, and a framework to describe the mechanisms that facilitate or hinder the success of interventions and individuals in social networks.

We applied our findings in the field through network interventions in Swiss schools, experiments on large digital platforms to increase sustainable consumption patterns, and seeding programs to promote sustainable behaviors among cocoa farmers in Côte d'Ivoire.

Word cloud of the most frequently used words  
in the papers of the URPP Social Networks



mental health personality psychology longitudinal  
cross-national comparison comparative  
effect basic human statistical community information  
algorithm psychology structural equation  
simulation economic physics psychological  
five theory  
**personality**  
system new dynamic complex online  
human testing metatraits analysis  
**value** social structure  
cross-cultural detection research  
methods traits consumer data ethnic  
polish **network** survey  
marketing invariance study  
modeling **behavior** cross-national  
relationship market immigrant  
attitudes **network analysis** frontiers  
nestedness health personal adaptation big  
**model measurement**  
science cross-cultural psychology  
differences individual sociological immigration  
approach political comparison  
psychological assessment international european social  
circumplex **public opinion** european  
personality assessment comparability temperament

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- Stiftung für Technologiefolgen-Abschätzung TA-SWISS

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# References

More information on the findings of the URPP Social Networks and a full list of publications can be found on [www.socialnetworks.uzh.ch](http://www.socialnetworks.uzh.ch)

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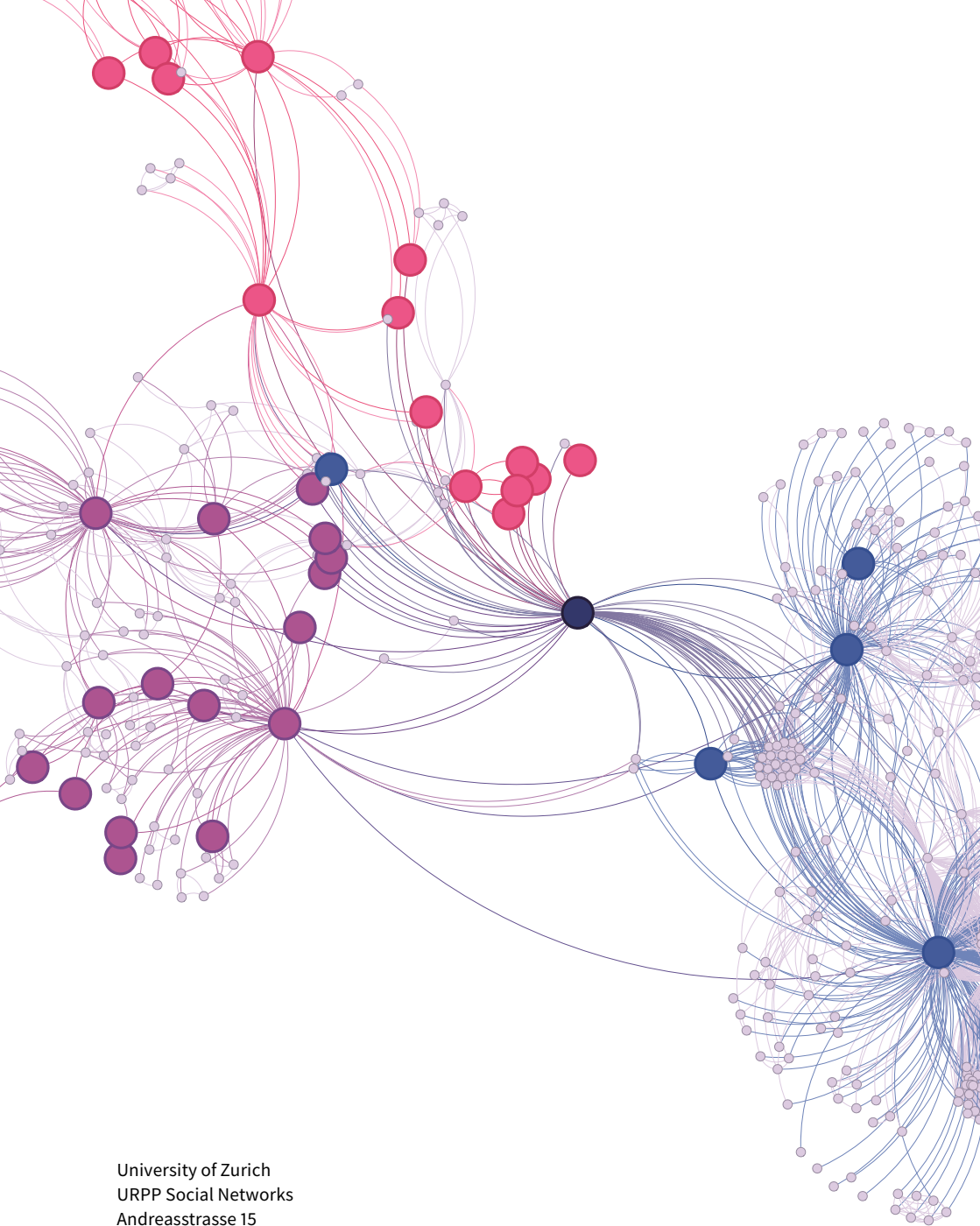
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